

H/OZ: PFD and Collaborative Flight Control System, Phase I

Completed Technology Project (2008 - 2008)



Project Introduction

With aircraft automation increasingly able to control flight autonomously, situational awareness and engagement of the crew can suffer. To improve aviation safety further we need new paradigms to balance between exploiting increasingly powerful technologies and retaining and promoting aeronautical decision making (ADM) by the crew. This proposal explores integrating H-mode, a flight control system developed by researchers at the NASA Langley Research Center (LaRC) that shares workload with pilots to leverage the unique capabilities of human pilots and automated control systems, with OZ, a primary flight display system under development at eSky. OZ provides a single-screen display for IMC flight, mapping external objects such as airports, waypoints, air traffic, weather etc. onto the primary flight display. The hybrid system (H/OZ) will allow the pilot both to retain situational awareness and to monitor the flight and select alternative actions at critical points. H/OZ will marry the superior situational awareness capability of OZ with the superior cooperative flight control of H-mode. In phase 1, eSky will develop a design for H/OZ and explore the feasibility of key new design elements. eSky will map the user interface of H-mode into the OZ display and add functionality to both. In collaboration with LaRC, the Florida Institute for Human & Machine Cognition and the University of Maryland, eSky will identify specific areas critical to the performance of H/OZ and use rapid prototyping to evaluate the usability of the new design elements. New OZ functionality will be evaluated using an eSky OZ laptop simulator. H-mode prototyping will be done in the NASA LaRC H-mode simulator. Feasibility will be tested by demonstrating that the OZ display metaphor supports full H-mode functionality without compromising the usability of the H-mode user interface. Phase 2 will focus on creating an H/OZ simulator and on usability and performance testing.



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

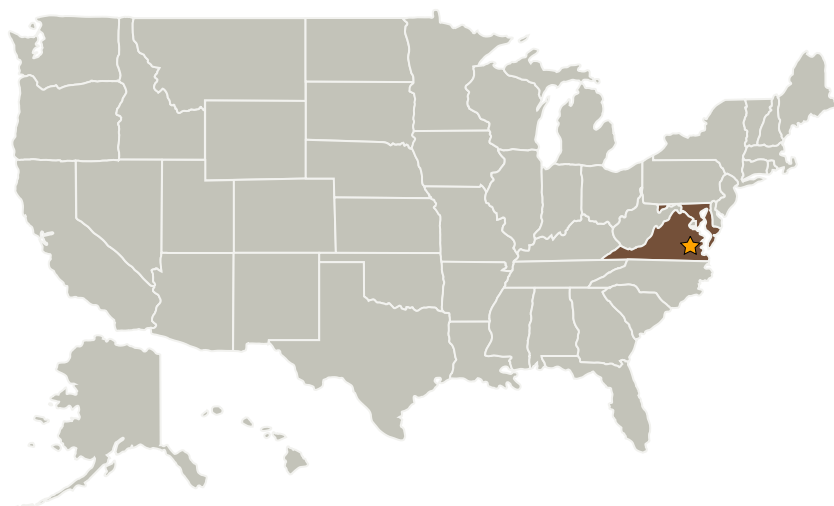
Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer



Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Langley Research Center (LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Emerald Sky Technologies, LLC	Supporting Organization	Industry	Columbia, Maryland

Primary U.S. Work Locations

Maryland	Virginia
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Steven L Fritz

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.2 Extravehicular Activity Systems
 - └ TX06.2.3 Informatics and Decision Support Systems